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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,725	10/22/2003	Hisao Asaumi	8373.318US01	6824

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EXAMINER
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MCCLOUD, RENATA D

ART UNIT	PAPER NUMBER
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2837

DATE MAILED: 06/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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## Office Action Summary

Application No.

10/691,725

Applicant(s)

ASAUMI ET AL.

Examiner

Renata McCloud

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Objections*

1. Claim 2 objected to because of the following informalities: the status identifier is incorrect. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1,4,5 rejected under 35 U.S.C. 103(a) as obvious over Imaseki et al (US 5453930).

**Claim 1:** an apparatus comprising first and second motors (Fig. 5:4A,5A ) each generating a steering force applied to a steering system of a vehicle that is connected to wheels (Fig. 5) to assist a driver's manual steering effort in steering the wheels (fig 5:2B,3B); first and second drive circuits (Fig. 5:8A, 9A, fig 8:47,48) for PWM controlling the first and second motors (col. 18:11-25), each of the drive circuits switched on and off at a control frequency (col. 18:11-25, command speed); a controller (20) determining the control frequency at which the switching element of the first drive circuit is switched on and off and the control frequency at which the switching element of the second drive circuit is switched on and off (Col. 12:43-67), wherein the first control frequency is different than the second control frequency (col. 12:27-67, there is a speed difference, so one speed has to be greater than the other). They do not teach the drive circuits comprising a switching element or first control frequency has a value greater than the second control frequency. It would have obvious to one having ordinary skill in the art at the

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time the invention was made to have switching elements in the drive circuits and to have a first control frequency having a value greater than the second control frequency since it is well known in the art that PWM controlled converters comprise switching elements and since it is well known in the art that having a speed difference comprises on speed to be greater than the other. The advantage of this would be the ability to control the speed of the motor to allow the wheels to safely turn.

**Claim 4:** the controller produces first and second control signals (col. 12:43-67).

**Claim 5:** the control system comprises a first controller producing a first control signal (fig 8:47) and a second controller producing a second control signal (fig. 8:48),

4. Claim 6 rejected under 35 U.S.C. 103(a) as obvious over Imaseki et al in view of Masaki et al (US 5345155).

**Claim 6:** Imaseki et al determining torque based on speed (col. 3:57-65) and a vehicle speed detector (Fig. 5: 13) that inputs a speed signal to the control system (col. 12:33-34). They do not teach a torque detector. Masaki et al '155 teaches steering torque detector that inputs a torque signal to the control system (Fig. 1: 13a, 13b). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Imaseki et al to have a torque sensor as taught by Masaki et al in order to sense instability and have enhanced vehicle drivability.

5. Claims 2,3,7,8 rejected under 35 U.S.C. 103(a) as obvious over Masaki et al (US 5481460).

**Claim 2:** an apparatus comprising first and second motors (Fig. 5:4A,4B) each generating a steering force applied to a steering system of a vehicle that is connected to wheels

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(Fig. 1 ) to assist a driver's manual steering effort in steering the wheels (Fig. 1:2a-d); first and second drive circuits (Fig. 1: 4a, 4b) for PWM controlling the first and second motors each of the drive circuits switched on and off at a pulse (col. 4:36-43); a control system (Fig. 1:6; Fig. 2: 16,17; Fig. 12: 16,17,20) connected to the drive circuits (Fig. 1: 4a,4b; Fig. 2: 19a,19b; Fig. 12: 19a,19b) and producing a first pulse at first phase (Fig. 12: Vau) for switching the switching elements of the first drive circuit (Fig. 12: 19a) and producing a second pulse signal (Vbu) at a second phase for switching the second drive circuit (Fig. 12: 19b) wherein the first phase is offset from the second phase (col. 13:35-61). They do not teach the drive circuits comprising a switching element or. It would have obvious to one having ordinary skill in the art at the time the invention was made to have switching elements in the drive circuits since it is well known in the art that PWM controlled inverters comprise switching elements. The advantage of this would be the ability to control the speed and power of the motor

**Claim 3:** the first and second pulse signals are provided with the same speed (col. 11:15-45)

**Claim 7:** the controller produces first and second control signals (col. 13:35-61)

**Claim 8:** the control system comprises a first controller producing a first control signal and a second controller producing a second control signal (col. 13:35-61)

6. Claim 9 rejected under 35 U.S.C. 103(a) as obvious over Masaki et al (US 5481460) in view of Masaki et al (US 5345155).

**Claim 9:** Masaki et al '460 teach determining torque based on speed and a vehicle speed detector (Fig. 5: 17) that inputs a speed signal to the control system (col. 5:22-30). They also teach sensing either torque or speed (abstract). They do not teach a torque detector. Masaki et al '155 teaches steering torque detector that inputs a torque signal to the control

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system (Fig. 1: 13a, 13b). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Masaki et al '460 to have a torque sensor as taught by Masaki et al '155 in order to sense instability and have enhanced vehicle drivability.

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renata McCloud whose telephone number is (571) 272-2069. The examiner can normally be reached on Mon.- Fri. from 5:30 am - 2pm.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on (571) 272-2800 ext. 37. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Renata McCloud  
Examiner  
Art Unit 2837

RDM

  
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